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VI.—*Descriptions of new Genera and Species of Exotic* Hymenoptera.

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Since the publication of the 'Catalogue of the *Formicidæ*,' in 1858, I have described nearly two hundred new species belonging to that family, the whole being inhabitants of the Eastern Archipelago. I have not described, since the above period, any Ants from other localities; the consequence has been, that many interesting and some remarkable species have accumulated which are new to science; a portion of these I purpose describing in the present paper, and also figuring some of the more remarkable forms. I hope to add additional interest to my work, by compiling a series of observations on the habits of some of the species, from notes made on the spot by Mr. H. W. Bates, who has in so many ways added greatly to our knowledge of the entomology of Brazil.

I think it will be readily admitted that no family in the wide range of the Insect world contains species which present such a wonderful diversity of forms as are to be found amongst the *Formicidæ*; so great is it, indeed, that nothing short of actual observation could possibly lead the entomologist to suppose, in many instances, that any relationship existed between the different members of the same community. In my correspondence with both Messrs. Wallace and Bates, I have always impressed upon them the importance of collecting these insects from their nests, or under such circumstances as would warrant their being considered sexes of the same species; to my request both these gentlemen have most willingly responded. A few species obtained under such conditions, are of more real ento-

mological value than hundreds of specimens taken at random, without even a local habitation or a name.

Great as is our astonishment when we behold the endless diversity, I may add, the eccentricity of form in these remarkable insects, it will not for a moment bear comparison with the wonder which irresistibly seizes us when we are led into the details of their marvellous individual economies. Wonderful, doubtless, are many monuments of engineering skill—vast tunnels excavated under lofty hills, or hewn through solid rocks — mighty pyramids heaped up thousands of years ago; but the Ant (*Œcodoma*), ages preceding the epoch of the construction of our tunnels, or of the marvels of Egypt, bored her highways beneath the rivers of Brazil, and raised her mounds, which, when compared with the tiny architects, outstrip even the gigantic pyramids themselves.

The three genera treated upon in the present paper are each remarkable for readily distinguished characteristics: *Cryptocerus* especially for the endless diversity of form in the different species, and many of the species for the extraordinary differences in the sexes of the same community.

The species of the genus *Pseudomyrma* are distinguished by their elongate form, petiolated abdomen, and by the greatly enlarged eyes of all the sexes, in many species occupying the entire sides of the head.

In the genus *Eciton* we have the reverse of the genus *Pseudomyrma*; at least it is so in the only sex yet discovered—the worker; in these the eyes are so small, that, except in two or three species, they cannot be seen without a high magnifying power, whilst in three species I have been unable to discover any eyes at all. I shall now proceed to give some account of the habits of the genera, in the order in which I have here enumerated them.

The habits of a few species of the genus *Pseudomyrma* have been observed: most of these excavate the pith from dried twigs; in the tunnels or burrows thus formed the eggs are laid, and the young brood developed: the communities are small, frequently not more than twenty, exclusive of larvæ and pupæ. One species, *P. termitaria*, constructs its nest, or more correctly, takes up its abode, in the tumuli of different species of *Termes*: others form small elliptical chambers in the outer walls of Termitaria, a single colony only apparently occupying each chamber; these are usually wide apart, and do not appear to contain communities which have any connexion with each other. The pupæ of this genus of Ants do not spin cocoons. The insects, when at large, are to be seen coursing rapidly over trees and herbage; their sting is very slight.

The species of the genus *Eciton* are very abundant, and cannot fail to attract general attention; we are now acquainted with about twenty species. The processions of these insects are of common occurrence; and the different colours of the species are very observable when the lines are seen upon the march, some, as Mr. Bates remarks, appearing like "a liquid stream of metal." These Ants are regular clearers of all animal matter, living or dead: when on a foraging expedition, they spread out their columns, climbing over every leaf, plant, shrub, and tree, putting the whole animal as well as insect world into commotion and alarm; should any decaying mass of vegetable matter fall in their way, it is instantly covered with a living crowd, every chink and cranny is carefully searched, after which the army resumes its march. All apterous insects, particularly *Blattæ* and Spiders (the former being exceedingly numerous under fallen leaves, especially in their larva state), are preyed upon; the larvæ of Lepidoptera and Diptera fall an easy prey, as well as the species of *Formicidæ*. At other times a community of *Ecitons* engage in a regular attack upon a nest of some peaceful and industrious species of *Formica*; the *Ecitons* crowd into the nest of the ants, each seizing upon a helpless victim, and carry or drag it out of the nest; if the ant prove too bulky for a single *Eciton* to carry, it is ruthlessly torn into pieces, two or more assisting in the operation. The march is then commenced back to the nest of the *Ecitons*, the living ants and the mangled remains of others being probably conveyed there for the purpose of feeding the young brood of the marauders.

Every community of *Eciton* consists of two distinct forms of workers, besides the males and females. In the typical species, *E. hamata*, the large worker, or soldier, is furnished with long, curved, sickle-shaped mandibles; there is no gradation either in the form of these organs, or between these larger ants and the ordinary smaller workers: these soldiers bear the proportion of about five to one hundred of the smaller individuals. In other species, such as *E. vastator* and *E. erratica*, described in the present paper, the soldier workers have the head greatly enlarged, with mandibles of the ordinary size; but even here there is no trace of gradation between the two forms: it is true that the smaller form has individuals differing in size; so also, but in a less degree, do the big-headed soldiers differ in size; but between the two distinct forms there are no gradations which would unite them.

Although the ants belonging to this genus are so numerous in Brazil that they cannot fail to attract the notice of the naturalist,

yet hitherto no one has been fortunate enough to discover either the male or female of a single species; "their societies," says Mr. Bates, "are so numerous, and their sting so severe, that an attack upon one of their colonies is not to be rashly undertaken."

The species of the genus *Cryptocerus* are not unfrequently to be observed on low trees and bushes in dry open places, or running on branches of newly felled trees; they also visit flowers abundantly. The species generally are wood-borers, usually perforating the dead branches of trees. The males and females are winged, the latter only temporarily so. The typical species, *C. atratus*, has been observed to construct its nests in the dead suspended branches of woody climbers; outside is seen a number of neatly drilled holes, but inside the whole solid wood is perforated with intercommunicating galleries. Each community appears to consist of a single female and two kinds of workers; the latter, in some species, are quite unlike each other, differing in the form of the head, and in the armature of the thorax and nodes of the peduncle. The species appear to be omnivorous, and are frequently attracted by the excrement of birds. These insects, like those belonging to the genus *Myrmica*, do not, in the pupa state, enclose themselves in cocoons.

The new species of the genus *Epomidiopteron*, from Mexico, is exceedingly interesting; the only one previously described was from Brazil. I also describe a new species of the rare genus *Trigonalys*, from Mexico; Shuckard has described one from South Carolina; two are therefore known from North America, four have been discovered in South America, one in Celebes, one in Australia, and one in Europe, making in all nine species of this beautiful genus.

Family **Formicidæ**, *Leach.*

Genus Formica, *Linn.*

1. *Formica chartifex.*

Operaria. *F.* castaneo-rufa, vertice nigro; thorace postice attenuato; abdominis squamula incrassata, supra rotundata. *Mas.* Fusco-nigra, pilis cinereis hirtula; alis pellucidis, venis fusco quasi marginatis.

Worker. Length 3 lines. Of a bright chestnut-red; the vertex black; a fuscous stain on the thorax anteriorly, and the abdomen more or less fuscous; entirely smooth and shining. The front of the head very prominent, and much narrowed behind the eyes; the antennæ elongate, as long as the body. The thorax narrower than the head, somewhat compressed behind, the metathorax curving from the base to the apex downwards. Abdomen ovate, sometimes fusco-ferruginous, sometimes

clear chestnut-red; the scale of the peduncle incrassate at the base, its superior margin sharp and rounded; the body, antennæ, and legs with a scattered, thin, pale pubescence.

Male. Length 3¼ lines. Brownish-black, shining; the legs very slender, elongate, and, as well as the apex of the abdomen, pale rufo-testaceous. The head narrower than the thorax; the antennæ a little longer than the thorax, very slender, the scape as long as the flagellum. The abdomen ovate-lanceolate, the scale of the peduncle subglobose.

Hab. Ega (Brazil). In the Collection of the British Museum.

This ant constructs a papery nest, in texture and appearance like thin coarse brown paper; it is usually attached to the underside of a leaf, and about 2 inches long by 1 inch broad; the inner chambers are intricate and irregular: when alarmed, the workers issue forth in great commotion, making a curious rattling noise by vibrating their abdomens over the papery nest, apparently for the purpose of intimidating their enemies.

2. *Formica nidulans.*

F. fusco-nigra, pilis flavo-cinereis hirtula; abdomine ferrugineo (♀); alis pellucidis, venis fusco quasi marginatis (♂ ♀).

Female. Length 3½ lines. The head, antennæ, thorax, and legs dark brown; the head finely shagreened; the front, as well as the eyes, prominent, the latter ovate; the ocelli minute; the mandibles ferruginous, and furnished with a number of acute black teeth; the tips of the antennæ rufo-testaceous; the head and scape with a thin yellowish-white pubescence. Thorax black, with the intermediate and posterior coxæ, the base of their femora, the anterior femora beneath, and the apical joints of all the tarsi rufo-testaceous; the thorax is finely shagreened, and has a thin, scattered, pale pubescence; the legs are also pubescent; wings subhyaline, the nervures fuscous, with a brown stain along their course. Abdomen ferruginous and pubescent; the scale of the peduncle black, incrassate, its superior margin rounded.

Worker. This is rather smaller than the female, the thorax more elongate, the sides straighter and narrowed posteriorly; the legs paler and rather more elongate.

Hab. St. Paul (Brazil). Taken from the nest by Mr. H. W. Bates. In the Collection of the British Museum.

Subfamily Myrmicidæ, *Smith.*

Genus Pseudomyrma, *Guér.*

1. *Pseudomyrma perforator.*

P. capite thoraceque nigro-fuscis; abdomine rufo-testaceo.

Worker. Length 3½ lines. The head, thorax, and femora dark

brown; the femora pale fusco-testaceous, subpilose, and slightly shining; the abdomen pale rufo-testaceous; the mandibles and anterior margin of the face narrowly pale rufo-testaceous; the antennæ fuscous, with the extreme base and apex of the scape, and four or five of the apical joints of the flagellum pale testaceous; eyes ovate, very large, occupying nearly the whole of the sides of the head; the tibiæ and tarsi pale rufo-testaceous, the posterior pair of the latter slightly fuscous; the first node of the abdomen with a slender petiole.

Hab. Ega. In the Collection of the British Museum.

2. *Pseudomyrma agilis.*

P. capite thoraceque nigro-æneis; mandibulis pallide testaceis; antennis, pedibus abdomineque pallide ferrugineis.

Worker. Length 4 lines. Head and thorax nigro-æneous; the head large, much wider than the thorax; eyes large, prominent, and ovate; the anterior margin of the face and the mandibles pale testaceous; the antennæ rufo-testaceous, slightly fuscous above. Thorax flattened above, and having a shining silky gloss; the legs rufo-testaceous, the coxæ, trochanters, and base of the femora slightly fuscous. Abdomen pale ferruginous; the petiole slender; covered with a short pale pubescence, the apex with a few long dark hairs.

Hab. St. Paul (Brazil); captured by Mr. H. W. Bates. In the Collection of the British Museum.

3. *Pseudomyrma concolor.*

P. polita, rufo-fulva; pedibus concoloribus; scutello et spatio ocellari fuscis.

Female. Length 4 lines. Shining fulvous-red; the head oblong, palest anteriorly; the eyes, ocelli, and space between them black. The thorax elongate-ovate; the scutellum and post-scutellum black. Abdomen oblong, pointed at the apex; the first node clavate, short and stout; the second node subglobose.

Hab. St. Paul (Brazil). In the Collection of the British Museum.

4. *Pseudomyrma atripes.*

P. polita, pallide fulva; abdominis segmentis duobus basalibus nigro variegatis; pedibus mediis et posticis nigricantibus.

Worker. Length $4\frac{1}{2}$ lines. Pale fulvous; the anterior margin of the face and also the mandibles pale testaceous, the scape and teeth black; the flagellum fuscous, with three or four of the apical joints fulvous. The thorax flattened above, the metathorax obliquely rounded; the thorax narrower than the head, broadest in front, with the anterior margin slightly rounded; the intermediate and posterior tarsi nearly black, the tibiæ fuscous outside. The petiole and three spots on the

second node black; the insect is thinly sprinkled with erect fuscous hairs, most dense at the apex of the abdomen.

Hab. Brazil. In the Collection of the British Museum.

Genus Eciton, *Latr.*

1. *Eciton vastator.*

E. rufo-fulva, lævis et nitida; capite maximo, in medio sulcato, abbreviato; mandibulis nigris, longitudinaliter striatis; oculis obsoletis.

Worker major. Length 3 lines. Rufo-fulvous; the head and abdomen smooth and shining, the thorax subopake. The head very large, more than twice the width of the thorax, subquadrate, rather longer than broad, with an abbreviated impressed line between the antennæ; the anterior margin of the head (narrowly) and the mandibles black, the latter longitudinally striated, and with a single tooth in the middle of their inner margin; the head is distantly and finely punctured, with a few stronger punctures at the anterior margin laterally; the antennæ short, moderately stout, pubescent, and about the length of the head. Thorax delicately shagreened; the legs paler than the thorax, and thinly sprinkled with short pubescence. Abdomen subglobose, pubescent, particularly the apical segments; the nodes of the peduncle subquadrate, the anterior margin above rounded; an acute spine beneath the anterior node.

Worker minor. Length $1\frac{3}{4}$–$2\frac{1}{4}$ lines. Of the same colour as the *worker major*, excepting that the mandibles are obscure fusco-ferruginous, not black; the head narrower, more oblong, and slightly narrowed behind.

Hab. Ega.

This ant I believe to be destitute of organs of vision. In the place where the eyes are usually situated, I discovered, with a high magnifying power, a minute pit. Mr. Bates observed that this insect showed a great aversion to light, taking every means of hiding from it.

2. *Eciton erratica.*

E. opaca, rufo-fulva; capite maximo, in medio sulcato; mandibulis rufo-fuscis, longitudinaliter striatis; oculis obsoletis.

Worker major. Length $3\frac{1}{2}$–4 lines. Rufo-fulvous, opake; the head very large, subquadrate, rather longer than broad, with a central impressed line between the antennæ running upwards nearly to the posterior margin of the vertex; the head is delicately shagreened, and has a regular set of scattered punctures, in each of which is a pale, short, erect hair; the anterior margin of the head and the mandibles rufo-fuscous, the latter with a single tooth in the middle of its interior margin, and a number of erect pale hairs. Thorax finely shagreened and slightly pubescent; the legs pubescent. Abdomen subglobose; the nodes of the peduncle subquadrate; the first with a short, stout, acute spine beneath.

Worker minor. Length 1–3 lines. Of the same colour and punctation as the *worker major*; small specimens are usually paler; all the individuals have the head much narrower and longer than in the larger form, and it is also widest in front. The thorax at the sides in front is obscurely fuscous; this character is rarely observable in the large examples. The antennæ in this species are rather longer than in *E. vastator*.

Hab. Ega.

The habits of this species are very singular; it does not, like many other species, march in long columns, crossing open spaces, and climbing up trees and bushes, but constructs covered ways built of minute grains of earth, beneath the protection of which the lines of foragers march, when engaged in plundering other ants' nests; if a gallery of this kind is broken into, the larger workers or soldiers rear their heads and gesticulate in a threatening manner. On examining this species under a powerful microscope, I could detect only an irregular pit in the usual situation of the minute eyes of this genus.

Genus Strumigenys, n. g.

Head cordate; mandibles porrect, tridentate; eyes round, placed anteriorly at the sides of the head, at the extremity of a broad, deep excavation; the antennæ inserted in the excavation, into which they are received in repose; the flagellum 5-jointed; the scape three-fourths of the length of the flagellum; the ocelli placed in a triangle on the vertex, obsolete in the workers. Thorax ovate, oblong, and attenuated posteriorly in the workers; the anterior tibiæ only furnished with a single spine at their apex. Abdomen with two nodes, the first attached to the thorax by a short petiole; both are subovate, the second twice the width of the first; the abdomen subovate, and pointed at the apex.

The genus *Strumigenys* is doubtless closely allied to the *Daceton* of Perty; these genera, with that of *Orectognathus*, form a small group of ants, which appear to me to lead into the family of the *Cryptoceridæ*; they agree with the latter insects in having the antennæ placed at the sides of the head in a groove, into which they fall when in repose; they are also, like some species of *Cryptoceridæ*, more or less ornamented with scales.

1. *Strumigenys mandibularis.* (Plate IV. fig. 6♀, 7☿.)

S. rufo-ferruginea; capite cordato; abdomine lævissimo, nigro.

Female. Length 2⅓ lines. Rufo-ferruginous; the head black and opake, with the anterior and posterior parts ferruginous; the mandibles produced, with their apex curved inwards, forming an acute, stout tooth; there are also two short, stout, blunt ones near their apex on the inner

margin; the antennæ with the flagellum clavate, and pointed at their apex; the head and antennæ sprinkled with minute glittering semi-transparent pale scales. Thorax short, subovate; the scutellum semicircular and prominent; the metathorax abruptly oblique, deeply excavated behind; the legs with glittering scales. Abdomen subglobose, the apex pointed; the nodes subglobose, the first petiolated; the second segment obscure red; the abdomen delicately aciculated longitudinally.

Worker. Length 1¼ line. The head, thorax, legs, and nodes of the abdomen rufo-ferruginous, and sprinkled with minute glittering scales; mandibles elongate, produced, with three long acute teeth; the head more elongate than in the female. Thorax elongate and narrowed behind; the thorax and legs sparingly sprinkled with glittering scales. Abdomen smooth, shining black.

Hab. St. Paul (Brazil). In the Collection of the British Museum.

This curious species is found, Mr. Bates informs me, running slowly and prowling about the bark of trees.

Subfamily Attidæ, *Smith*.

Genus Myrmicocrypta, n. g.

Head oblong, narrowed anteriorly; eyes round and prominent; antennæ inserted in the middle of the anterior part of the head, outside of two elevated carinæ; the flagellum subclavate, increasing in thickness to the middle of the apical joint, which is pointed at the apex, and twice the length of the penultimate joint; the scape about one-fourth shorter than the flagellum. Thorax oblong, widest in the middle; the anterior margin transverse, with the angles slightly produced; the scutellum deeply emarginate, forming a tooth on each side; the metathorax has also a tooth on each side; the superior wings with one marginal and one submarginal cell. Abdomen attached to the thorax by a petiole composed of two nodes; the first subglobose, the second cup-shaped, and as wide as the base of the abdomen.

The affinities of this very singular and minute ant are somewhat difficult to assign. After a careful examination of the characteristics of those genera to which, on a slight inspection, it appeared to me most nearly related, I am of opinion that its situation in the family is next to, or in the immediate vicinity of, the genus *Œcodoma*; it agrees with the species of that genus in many important characters, namely, in the form of the mandibles, in the situation and character of the antennæ, very closely in the venation of the wings, and in the intermediate and posterior tibiæ being destitute of spines at their apex. I have only seen one sex—the female; the discovery of the males and workers will probably furnish other important characters, which may show the exact situation that the genus ought to occupy, should I not have assigned it its true one.

1. *Myrmicocrypta squamosa.* (Plate IV. figs. 14–17.)

M. ochracea; corpore asperrime squamoso; alis subhyalinis.

Female. Length 1½ line. Ochraceous, and covered on every part with separate and not very distant scales, which are of a glittering semitransparent white,—those on the scape of the antennæ and legs most dense, the flagellum alone being naked; the mandibles stout, subtriangular, with seven acute teeth on their inner margin; the eyes and ocelli black; the apex of the joints of the antennæ fusco-ferruginous. Thorax: the disk rather darker than the sides or the legs; the anterior tibiæ armed at their apex with a stout flattened spur; the intermediate and posterior pair are not furnished with spines; the scutellum bidentate; the verge of the truncation of the metathorax is also bidentate. The abdomen is very finely and delicately reticulated, and of a rather darker colour than the head and thorax; the wings slightly coloured, semiopake, with the nervures pale testaceous.

Hab. St. Paul (Brazil); captured by Mr. H. W. Bates. In the National Collection.

Genus Pheidole, *Westw.*

1. *Pheidole diversa.*

P. nigra, nitida; capite maximo, elongato-quadrato, postice profunde emarginato, antice striato.

Worker major. Length 3¼ lines. Black and shining; the head oblong-quadrate, deeply emarginate behind, and with a central deeply impressed longitudinal line; the scape of the antennæ, the mandibles, and anterior margin of the head obscure ferruginous; the flagellum rufo-testaceous; the head longitudinally striated, with the hinder portion rugose. The thorax and legs ferruginous, the former obscure above and coarsely rugose; the metathorax with two erect acute spines; the femora and tibiæ more or less fuscous in the middle above. Abdomen ovate, very smooth and shining; the insect thinly sprinkled with erect black pubescence.

Worker minor. Length 1¼ line. Pale rufo-testaceous; the abdomen slightly fuscous above; the head very smooth and shining, of the ordinary size, as in *Myrmica scabrinodis*, thinly covered with erect pale pubescence.

Hab. St. Paul (Brazil).

Subfamily Cryptoceridæ, *Smith.*

Genus Cryptocerus, *Latr.*

1. *Cryptocerus quadrimaculatus*, Klug.

Fœmina. C. elongatus, aterrimus; abdomine flavo 4-maculato.

Operaria. C. niger, depressus, setis argenteo-nitidis ornatus: capitis ante oculos marginibus lateralibus pallide ferrugineis; tibiis ferrugineis: thorace latere utroque spinis duabus armato.

Worker. Length 3 lines. Black and shining; finely punctured, each puncture having a shining silvery seta; the margins of the head before the eyes, the apex of the scape and also of the flagellum pale ferruginous. Thorax much narrower than the head, armed on each side anteriorly with two acute stout spines, from which it is much narrowed to the base of the metathorax, which has a long, stout, blunt spine at each of its posterior angles, these spines each having a smaller one at their base outside; the tips of the femora, the tibiæ, and anterior tarsi ferruginous, the claw-joint of the intermediate and posterior tarsi ferruginous. Abdomen ovate, emarginate at the base, which has on each side a thin, transparent, pale lamina; the nodes of the peduncle transverse, and spinose on each side.

Hab. Brazil.

This insect is described as the worker of *C. quadrimaculatus* on the authority of Mr. H. W. Bates, who took them in their nest; of this species he remarks, "The difference between the female and worker in form is very remarkable: I find a constancy in the spines, &c., in all the workers, showing that the species are constant in their characters: the female has a spotted abdomen." The female is described by Klug in his Monograph on the genus; I have also described and figured it in the second volume of the 'Transactions of the Entomological Society,' new series.

2. *Cryptocerus elongatus*, Klug.

Fœmina. C. elongatus, aterrimus; thorace antice posticeque spinoso. Long. lin. 5.

Operaria. C. niger, depressus; capite thoraceque setis aurato-nitidis ornatis; thorace latere utroque spinis quinque acutis armato; capitis marginibus lateralibus ante oculos pallide testaceis.

Worker. Length 2–2½ lines. Black, depressed, and with glittering pale golden setæ on the head and thorax, sometimes a little on the legs and base of the abdomen; the sides of the head, before the eyes, pale rufo-testaceous, the margins narrowly membranaceous; the tip of the antennæ testaceous. Thorax: the anterior angles bispinose, from whence it is abruptly narrowed to the base of the metathorax, with a minute spine near the sutural division; the metathorax with a minute spine at its basal angles, and a long, stout, diverging one at the apical ones; the tarsi rufo-piceous at their apex. Abdomen ovate, with the basal margins narrowly testaceous; the nodes of the peduncle transverse, and having on each side an obtuse spine.

Hab. Brazil.

The worker is described on the authority of Mr. H. W. Bates; the female is described by Klug in his Monograph on the genus.

3. *Cryptocerus placidus.*

C. capite thoraceque nigris; antennis, pedibus abdomineque ferrugineis; alis fusco-hyalinis.

Male. Length 4 lines. Head black, transverse, with large shallow punctures on the vertex; the eyes large and prominent; the scape and basal joint of the flagellum black, the following joints ferruginous, and gradually thickening from the basal to the apical joint. Thorax, and also the coxæ, black; the mesothorax with large shallow punctures; the metathorax rugose above, truncate posteriorly, deeply emarginate behind, forming teeth at the lateral angles; the legs ferruginous; the wings fusco-hyaline, with the first submarginal cell clear hyaline. Abdomen ferruginous, with the nodes of the peduncle black; each node with a minute tooth at the sides.

Hab. St. Paul (Brazil).

4. *Cryptocerus laminatus.* (Plate IV. fig. 3.)

C. niger; antennis tibiisque subferrugineis; capite ante et pone oculos, abdominisque basi lamina pellucida instructis.

Worker. Length 2–2½ lines. Black, and sprinkled over with silvery-white glittering setæ; the sides of the head, before the eyes, broadly pale testaceous yellow; the eyes prominent, situated at the posterior angles of the head, which has the margin curved behind the eyes and emarginate in the middle; the antennæ pale beneath and fuscous above. The thorax with five pale spines on each side, the posterior pair longest; a deep strangulation at the base of the metathorax; the tips of the femora, the tibiæ, and apical joints of the tarsi pale ferruginous, the tibiæ with a dark stain beneath. The abdomen subcordate, the margins at the base pale and membranaceous; the nodes of the peduncle transverse; the anterior one subquadrate, with a pale acute spine on each side curved backwards towards the abdomen; the second node somewhat cup-shaped, terminating laterally in a pale acute spine, which is directed outwards.

Captured by Mr. H. W. Bates at Ega, Brazil. In the Collection of the British Museum.

5. *Cryptocerus grandinosus.* (Plate IV. fig. 5.)

C. ochraceus, supra squamis albis pellucidis transversis tectus; capite antice, thoracis lateribus, abdominisque nodis et basi glacie quasi marginatis.

Worker. Length 1½ line. Ochraceous; the head subquadrate, rather longer than broad; the sides before the eyes broadly pale luteo-testaceous, and the posterior margin laterally narrowly so; the eyes black, and the flagellum rufo-testaceous. Thorax: the anterior angles acute; the sides margined with a glassy-white, subtransparent membrane. The abdomen ovate, and emarginate at its base; the nodes of

the peduncle and the base of the abdomen with a glassy-white membranaceous margin. The insect sprinkled over evenly with minute white glittering scales or setæ.

Hab. Ega (Brazil). In the Collection of the British Museum, &c.

Some examples of this species are of a much darker colour than that of the description; they are usually considerably smaller, and are, I consider, the small form of the worker of this species; the margins of the head, &c., are of the same glassy whiteness, and contrast more strikingly than in paler examples.

6. *Cryptocerus bimaculatus.* (Plate IV. fig. 4.)

C. niger; capite antice et lateribus testaceis; abdomine elongato, basi utrinque flavo maculato.

Female. Length 3 lines. Black; the head and thorax with strong confluent punctures; the abdomen with a longitudinal striation at the base, the striæ slightly divergent. The head, viewed in front, ovate, slightly widest anteriorly, and emarginate in the middle in front; the sides of the head rufo-testaceous. Thorax transverse anteriorly, very slightly rounded, with the lateral angles acute; the sides of the thorax parallel to the insertion of the antennæ, from thence to the apex of the metathorax gradually narrowed, the metathorax abruptly truncate; the wings subhyaline, with the nervures fusco-testaceous. Abdomen elongate, the base emarginate, the apex rounded; a large ovate yellowish-white macula at each of the basal angles; the nodes of the peduncle with a small acute spine on each side.

Hab. Mexico. In the Collection of the British Museum.

Genus Meranoplus, *Smith.*

1. *Meranoplus striatus.* (Plate IV. fig. 1.)

M. niger; capite thoraceque longitudinaliter striatis; metathorace bispinoso; abdomine ovato, delicatule striato.

Worker. Length $2\frac{3}{4}$ lines. Black and slightly shining; the head strongly striated longitudinally, the striæ diverging from the centre; the palpi and extreme tip of the flagellum rufo-testaceous. The thorax strongly striated, widest in front, with an obtuse tooth on each side at the margin near the deep strangulation at the base of the metathorax, the latter terminating posteriorly in two long, stout spines; the legs rugose and slightly pubescent, the claws of the tarsi rufo-testaceous. Abdomen ovate, and very finely striated or aciculate longitudinally; the first node of the peduncle oblong and subovate; the second subquadrate, with the lateral margins rounded; both coarsely rugose.

Captured by Mr. H. W. Bates at St. Paul, Brazil. In the Collection of the British Museum.

2. *Meranoplus subpilosus.* (Plate IV. fig. 2.)

M. niger; thorace abdomineque longitudinaliter striatis; thorace spinis duabus postice armato; corpore pubescente.

Worker. Length $2\frac{1}{4}$ lines. Black: the head subovate, narrowed anteriorly, delicately and rather distantly punctured, very finely and indistinctly aciculate, with a little strong abbreviated striation at the posterior margin of the vertex. The thorax deeply striated; the transverse impressed line at the base of the metathorax profound; the metathorax with two straight, stout, acute spines directed backwards. Abdomen ovate, finely striated; the nodes of the peduncle with an irregular coarse rugose longitudinal striation; the body, as well as the legs, with a scattered, glittering, pale pubescence.

Captured by Mr. H. W. Bates at St. Paul, Brazil. In the Collection of the British Museum, &c.

Genus Ceratobasis, n. g.

Head oblong in the ♀ and ☿; eyes small and round, situated in a groove at the sides of the head, into which the antennæ are received in repose; the antennæ subclavate; the scape as long as the funiculus, and grooved beneath for its reception; the funiculus twelve-jointed; ocelli in a triangle on the vertex in the ♀, but wanting in the ☿; mandibles incrassate, produced, with their inner edge serrated. The thorax subovate in the ♀, oblong and narrowed posteriorly in the ☿; the superior wings with one marginal cell, open at its apex; one submarginal cell; the discoidal cells obsolete; legs stout and of moderate length; the claws of the tarsi simple; the metathorax with a tooth on each side of the insertion of the abdomen. Abdomen ovate, pointed at the apex, attached to the thorax by a petiole, which is binodose; the first node oblong-quadrate, the second subglobose. The body squamulose.

Note.—In my 'Catalogue of the *Formicidæ*,' I included this insect amongst those which form the genus *Meranoplus*. The species was received shortly before my work went to press, but the winged female has come to hand subsequently. The neuration of the wings is very different from that of the genus *Meranoplus*; I have therefore removed it from the genus in which I provisionally placed it. It is one of the most singular insects in the whole family of the *Formicidæ*.

1. *Ceratobasis singularis.* (Plate IV. figs. 12, 13.)

C. obscure fusco-brunnea, supra squamis pellucidis tecta; capite elongato; alis rufo-brunneis.

Female. Length 3 lines. Reddish-brown, with the head, thorax above, and apical half of the second segment of the abdomen very dark brown; thickly covered with white setæ, the abdomen most sparingly

so, the setæ on which are erect and narrowed at their base. The head oblong, and narrowed from the posterior margin to the base of the mandibles; above, with two impressed oblique lines, which run upwards and unite in the middle opposite to the insertion of the mandibles; a deeply impressed fovea above, in which is situated the anterior ocellus, behind which is a deep curved depression which crosses the head; the mandibles produced, incrassate, and finely serrated on their inner margin; the scape of the antennæ as long as the flagellum, broad and flattened, widest at the base, and fringed on its anterior margin with a row of white scales or setæ; the flagellum clavate. Thorax oblong, transverse in front, narrowed behind; the metathorax truncate; the wings brown. The first node of the abdomen oblong-quadrate, the second somewhat bell-shaped; the abdomen subovate, pointed at its apex and truncate at its base.

Worker. The same length as the female, but of a more elongate form; densely covered all over with a coating of brown scales or setæ; the head of the same form as in the female, but with the mandibles dilated and meeting only at their apex; the nodes of the abdomen similar to those of the female, but the basal one with a longer petiole.

Hab. Ega (Brazil).

The worker of this species is figured in my 'Catalogue of the *Formicidæ*,' but the species was obtained too late to give a detailed description; it will be found in my work under the name of *Meranoplus singularis*.

Family **Scoliadæ**, *Leach*.

Genus Epomidiopteron, *Romand*.

1. *Epomidiopteron elegantulum*.

E. nigrum, nitidum; abdomine pulchre prismatico, supra plagis sex flavo maculato; alis fuscis, violaceo-micantibus.

Female. Length 9 lines. Black: the head and scape of the antennæ shining; the former punctured, closely and strongly so on the face, but more finely and distantly on the vertex; the flagellum opake, fulvous beneath; the scape fimbriated beneath. Thorax: the prothorax with oblong punctures; the mesothorax with a few large punctures; the scutellum strongly punctured; the metathorax opake, with a fine sericeous pile; smooth at the base, and with a few transverse ridges at the verge of the truncation, the truncation striated, the striæ radiating from the centre; the legs set with coarse rigid pubescence, the calcaria pale testaceous, the pubescence on the tarsi pale ferruginous; the post-scutellum yellow; the wings dark fuscous, with a violet iridescence. Abdomen black, with a beautiful purple and violet iridescence; the three basal segments with a large ovate yellow macula on each side; the apical segment longitudinally striated, and with its posterior margin rounded and rufo-piceous.

Hab. Mexico. In the National Collection.

Family **Pompilidæ**, *Leach.*

Genus Planiceps, *Latr.*

1. *Planiceps concolor.*

P. nigro-violacea, sericea et iridescens; alis anticis nigro-purpureis micantibus, alis posticis pallidioribus viridi-tinctis.

Female. Length 5 lines. Deep blue, with brilliant reflexions in different positions; the mandibles obscurely ferruginous; the antennæ black. Thorax: the wings beautifully iridescent, the anterior pair dark brown, the posterior pale fusco-hyaline; the anterior tarsi rufo-testaceous, the intermediate tibiæ and tarsi slightly spinose. The abdomen of a smooth shining iridescent blue.

Hab. Mexico.

All the species of the genus *Planiceps* are insects of great rarity: four have been previously recorded; the two described in the present paper are, perhaps, the most beautiful that have been discovered.

2. *Planiceps notabilis.*

P. nigerrima, sericea; abdomine supra plagis quinque albido-luteis notato, 2·2·1; alis nigris, vix iridescentibus.

Female. Length $7\frac{1}{2}$ lines. Black, subopake, and covered with a fine silky silvery pile; that on the vertex and disk of the thorax has a purple iridescence; the mandibles obscurely ferruginous at their apex; the scape of the antennæ compressed; the posterior ocelli situated on the posterior margin of the vertex. Thorax: the wings very dark brown and slightly iridescent; the intermediate and posterior tibiæ and tarsi slightly spinose. Abdomen: a large subovate yellowish-white spot on each side of the second and third segments, and a single one at the base of the apical segment.

Hab. Mexico.

Family **Nyssonidæ**, *Leach.*

Genus Pison, *Spin.*

1. *Pison maculipennis.*

P. niger, subtiliter punctatus, sericeo-pubescens; capite antice aureo-villoso; thorace, pedibus abdominisque segmento primo et secundo ferrugineis; alis hyalinis, maculis fuscis.

Female. Length $4\frac{1}{2}$ lines. Head black, the face densely covered with golden pubescence; the scape, three basal joints of the flagellum, the clypeus and mandibles ferruginous. The thorax, legs and abdomen with a pale silky pubescent pile; the thorax ferruginous as well as the legs; the post-scutellum and sides of the metathorax black; the apical joints of the tarsi slightly fuscous; the wings hyaline, the externo-medial and the marginal cells occupied by a dark-fuscous cloud, the

stigma and first submarginal cell yellowish. Abdomen: the two basal segments ferruginous, the rest black; the apical margins of the first, second and third segments with narrow yellow fasciæ; beneath black, with the first segment and a spot on each side of the second ferruginous.

Hab. Ega (Brazil).

2. *Pison flavo-pictus.*

P. niger, lævis nitidusque; capite antice argenteo-villoso; thorace, pedibus abdomineque flavo-notatis; alis hyalinis.

Female. Length 4 lines. Black, smooth and shining; the clypeus, scape, and mandibles yellow, the latter rufo-piceous at their apex, the scape with a black line outside; the face and cheeks densely covered with silvery pubescence; the vertex very finely punctured. Thorax: the collar, tubercles, a spot on the tegulæ in front, and two large ones on the scutellum, yellow; the wings hyaline and iridescent, the nervures testaceous, the stigma fuscous; the base of the metathorax longitudinally striated; the two recurrent nervures received within the second submarginal cell; the tips of the femora, the tibiæ and tarsi pale yellow, the tips of the posterior tibiæ and of the intermediate pair beneath black; the apex of the joints of the tarsi and the claw-joint fuscous; a yellow spot on the coxæ. Abdomen: a large ovate yellow macula on each side of the second segment; the apical segment rugose, rufo-fuscous, and ferruginous at the apex.

Hab. St. Paul (Brazil).

3. *Pison lætus.*

P. niger, flavo-maculatus; metathoracis basi longitudinaliter striata; abdomine lævi, nitido; alis subhyalinis.

Female. Length 5 lines. Black; the head and thorax slightly shining and finely punctured; the clypeus, mandibles, and scape yellow, the basal half of the latter black behind; the clypeus, lower portion of the inner orbits of the eyes and the cheeks with silvery pubescence; the collar, tubercles, tegulæ in front, two ovate spots on the scutellum, the anterior and intermediate tibiæ in front, and a spot at the base of the posterior pair beneath, yellow; the base of the metathorax longitudinally striated, the sides with a little silvery pubescence; wings fusco-hyaline, the nervures fuscous. Abdomen smooth and shining, with an ovate macula on each side of the second segment.

Hab. Ega (Brazil).

Genus Philanthus, *Fabr.*

1. *Philanthus* (*Trachypus*) *cementarius.* (Plate IV. fig. 18.)

P. (*T.*) melleo-flavus, lucidus; capitis vertice et thorace supra nigris, flavo-vittatis; alis flavo-hyalinis.

Female. Length 8 lines. Honey-yellow: the vertex black above the

insertion of the antennæ, the yellow colouring extending obliquely upwards on each side; a yellow spot in front of the ocelli, and two oblique stripes behind them; the mandibles with their tips black; the antennæ fulvous beneath and rufo-fuscous above. Thorax: the pectus, the mesothorax, and base of the metathorax above, black; the mesothorax with two longitudinal yellow lines, which also cross the sides of the scutellum; a line over the tegulæ, the post-scutellum and two oblique lines beneath it, yellow; a black line down the centre of the metathorax; the wings flavo-hyaline, the nervures pale ferruginous, and a yellow spot on the tegulæ. The abdomen petiolated, entirely yellow, and very smooth and shining.

This is a fine addition to the division of the genus *Philanthus* which has the abdomen petiolated, of which Klug has formed the genus *Trachypus*; but having hitherto adopted the neuration of the wings as the primary character of generic subdivision, I use Klug's name merely as a sectional one. This insect was discovered by Mr. H. W. Bates at St. Paul, Brazil. Seven species of the petiolated *Philanthi* are now known.

APIDÆ.

Family **Cuculinæ**, *Latr.*

Genus Nomada, *Fabr.*

1. *Nomada advena.*

N. atra; antennis basi ferrugineis; capite antice, thorace abdomineque flavo-variegatis; alis hyalinis, maculis anticis fuscis; pedibus ferrugineis, maculis flavis.

Female. Length 4 lines. Black, smooth and shining; the face yellow; the scape and tips of the mandibles ferruginous. Thorax: a spot on each side of the collar, the tubercles, a large irregular-shaped spot beneath the wings, the scutellum and a minute spot at its anterior angles, the post-scutellum and the sides of the metathorax, yellow; the legs ferruginous; the anterior and intermediate tibiæ, the posterior pair outside, the basal joint of the posterior tarsi beneath, the posterior coxæ beneath, and four spots on the pectus, yellow; wings hyaline, with a dark fuscous stain on the margin of the anterior pair beyond the stigma, the posterior pair slightly stained at their apex. Abdomen: a yellow fascia on the first, second and fourth segments, that on the second wide at the lateral margins of the abdomen, and abruptly narrowed in the middle, where it is slightly interrupted; beneath, the second and third segments have a transverse yellow fascia in the middle.

Hab. Chili, or Columbia.

Genus Liogastra, *Perty*.

1. *Liogastra quadriplagiata*.

L. nigerrima, pilosiuscula; abdominis basi plagis quatuor lutescenti-albis ornata; capite supra, thorace antice et lateraliter albo-pilosis; alis nigrescentibus violaceo-micantibus.

Male. Length $9\frac{3}{4}$ lines. Jet-black, and thinly sprinkled with pale glittering silky pubescence; the face as high as the insertion of the antennæ, and a line on each side above them, nearly meeting in front of the ocelli, covered with white pubescence; the clypeus widely emarginate; the anterior margin of the labrum rounded; the antennæ rufo-piceous beneath, and with an elevated carina between their insertion. Thorax: two transverse spots in front, a larger subovate one beneath the wings, and a line on each side of the metathorax covered with white pubescence; the scutellum bituberculate; the wings nigro-fuscous, with a bright violet iridescence. Abdomen: a large ovate macula of white pubescence on each side of the two basal segments.

Female. This sex differs in having the face black, and the white spots on the thorax nearly obsolete: the spots on the abdomen are much smaller, and the apical segment is pointed; in the male it is bilobed.

Hab. Mexico.

This species was taken by M. Sallé; it is one of the most beautiful of the whole family of Apidæ, and is the fourth species discovered of the genus to which it belongs; the other three are from Brazil.

ICHNEUMONIDÆ.

Family **Aulacidæ**, *Shuck*.

Genus Trigonalys, *Westw*.

1. *Trigonalys ornata*.

T. nigro-fusca; capite thoraceque maculis flavis ornatis; abdomine flavo-fasciato; alis hyalinis; pedibus flavis.

Length $5\frac{1}{2}$ lines. The head large, wider than the thorax; the margins rounded, somewhat flattened in front; the clypeus transverse, its anterior margin slightly rounded and emarginate in the middle; the head, mandibles, and four middle joints of the antennæ of a sulphur-yellow; the mandibles with three black teeth; a minute black, or rather a fuscous spot between the antennæ, a circular broad ring above them extending to the first ocellus and uniting with a subtriangular spot enclosing the posterior ocelli, on each side of which is another curved fuscous stripe, which becomes narrower and unites at the margin of the vertex. The thorax and legs are yellow; the former has three broad longitudinal stripes on the mesothorax, another on the scutellum and metathorax in the middle, and also a small triangular spot on each

side of the scutellum, dark fuscous; the wings hyaline, with a slight fuscous stain along the anterior margin of the superior pair. Abdomen fuscous, darkest towards the apex, with a yellow fascia on the posterior margin of all the segments.

Hab. Mexico.

EXPLANATION OF PLATE IV.

Fig. 1. *Meranoplus striatus* ♂.
Fig. 2. *Meranoplus subpilosus* ♂.
Fig. 3. *Cryptocerus laminatus* ♂.
Fig. 4. *Cryptocerus bimaculatus* ♀.
Fig. 5. *Cryptocerus grandinosus* ♂.
Fig. 6. *Strumigenys mandibularis* ♀.
Fig. 7. *Strumigenys mandibularis* ♂.
Fig. 8. Antenna of *Strumigenys* ♀.
Fig. 9. Antenna of *Strumigenys* ♂.
Fig. 10. Mandible of *Strumigenys* ♀.
Fig. 11. Mandible of *Strumigenys* ♂.
Fig. 12. Head of *Ceratobasis singularis* ♀.
Fig. 13. Wing of *Ceratobasis singularis* ♀.
Fig. 14. *Myrmicocrypta squamosa* ♀.
Fig. 15. Wing of *Myrmicocrypta squamosa* ♀.
Fig. 16. Antenna of *Myrmicocrypta squamosa.*
Fig. 17. Mandible of *Myrmicocrypta squamosa.*
Fig. 18. *Philanthus cementarius* ♀.

VII.—*On the* Coleoptera *of the Salvages.* By T. Vernon Wollaston, M.A., F.L.S.

The peculiar position of the almost inaccessible rocks of the Salvages, which lie in the direct course from Madeira to the Canaries, though somewhat nearer to the latter than to the former, give them an especial interest in the eyes of geographical naturalists,—particularly those, however, who have had an opportunity of studying the productions of the two neighbouring groups. The *quæstio vexata*, as to whether these several Atlantic islands are not, in reality, the mere exponents or outposts of an immense continent now for the most part submerged, may perhaps never be solved; yet certainly one of the best methods of helping towards a solution is carefully to examine the fauna and flora of what seem to be its detached portions, and then closely to compare them with each other, in order to ascertain whether they possess sufficient in common (after every reasonable allowance has been made for the accidental intermission